

## ABSTRACT OF THE DISCLOSURE

A process for fabricating a whole solid-state pH sensing device by using the polypyrrole as the contrast pH detector and a whole solid-state pH sensing device fabricated by the process are disclosed, wherein said device is a differential pair framework potential electrochemical sensing device fabricated by using a non-insulating solid-state inorganic ion-sensing membrane and a polypyrrole sensing membrane. The largest difference between the device of the present invention and the conventional potentiometric type pH sensor is that the sensor of the invention is a solid-state planar sensor. The differential pair framework uses tin dioxide as the ion-sensing membrane and the reference electrode, and uses a polypyrrole sensor as the differential sensor, wherein the sensitivity of tin dioxide is good and has a value up to 57 mV/pH, and the sensitivity of polypyrrole is about 27 mV/pH. These lead the sensitivity of the whole solid-state pH Sensing device to a value of 30 mV/pH and exhibits good linearity, so that the sensing device framework has practicability. Since the sensitivity of the polypyrrole can be controlled by means of its polymerization, a sensing device with controllable sensitivity can be fabricated for applying to the fabrication of a pH sensor or a biosensor.